



## MEDICAL.

### REPORT OF THE PRINCIPAL CIVIL MEDICAL OFFICER AND INSPECTOR-GENERAL OF HOSPITALS FOR THE YEAR 1918.

I HAVE the honour to submit the following report on the health and sanitation in Ceylon and on the administration of institutions of the Ceylon Civil Medical Department for the year ended December 31, 1918.

#### SECTION I.—POPULATION.

2. The population of Ceylon on December 31, 1918, inclusive of immigrant coolies (but exclusive of military and shipping), was 4,686,383. Of these, 7,301 were Europeans, exclusive of those who left on war service. This is an increase of 54,000 on the previous year's estimate of population.

#### SECTION II.—PUBLIC HEALTH.

3. *Vital Statistics.*—183,384 births were registered, in the proportion of 39·2 per 1,000 of the population per annum, as compared with 183,976 in the previous year, showing a decrease of 592. The deaths registered in 1918 totalled 149,407, as compared with 113,389 (an increase of 36,018 over the previous year), in the proportion of 31·8 per mille. The total number of persons treated in the hospitals in 1918 was 105,450, of whom 9,827 died. The number for 1917 were 98,134 patients, with a mortality of 8,734. At dispensaries 1,203,063 persons were treated, who paid 1,833,462 visits in 1918, as against 1,210,380 persons, who paid 1,832,733 visits in 1917.

4. With regard to the causation of deaths, the following table shows the same, registered under the several classes of disease, for the year under review :—

#### I.—General diseases—

(a) Epidemic diseases ..	23,699
(b) Septic diseases ..	119
(c) Tuberculosis diseases ..	4,144
(d) Venereal diseases ..	181
(e) Cancer or malignant diseases ..	481
(f) Other general diseases ..	10,972

#### II.—Diseases of the nervous system and organs of special sense ..

#### III.—Diseases of the circulatory system ..

#### IV.—Diseases of the respiratory system ..

#### V.—Diseases of the digestive system ..

VI.—Non-venereal diseases of genito-urinary system and annexa ..	853
VII.—The puerperal state ..	4,010
VIII.—Diseases of the skin and cellular tissues ..	10,102
IX.—Diseases of bones and organs of locomotion ..	11
X.—Malformations ..	13
XI.—Diseases of early infancy ..	8,184
XII.—Old age ..	4,194
XIII.—Affections produced by external causes ..	2,263
XIV.—Ill-defined diseases ..	23,056

5. The more notable causes of death were the following diseases :—

1. Pneumonia ..	16,770	10. Anchyllostomiasis and its sequelæ ..	2,328
2. Infantile convulsions ..	13,316	11. Puerperal septicaemia ..	1,727
3. Diarrhoea ..	9,982	12. Malaria ..	802
4. Rickets ..	5,139	13. Enteric fever ..	531
5. Anæmia ..	3,857	14. Tetanus ..	300
6. Phthisis ..	3,788	15. Rabies ..	51
7. Intestinal parasites ..	3,028	16. Deaths attributed to pyrexia of unknown origin ..	18,367
8. Dysentery ..	2,429		
9. Dropsy ..	2,330		

6. *Deaths due to Preventable Diseases*, i.e., to diseases due to faulty sanitary conditions, over-crowding, soil infection, defective or infected water supplies, &c., amounted to 12,264. This figure does not include infantile diarrhoea or infantile convulsions, though it is probable that a large number of deaths from infantile convulsions are due to malarial infection, and a large number of cases of infantile diarrhoea to improper dieting, defective sanitary surroundings, and neglect.

7. *Infantile Mortality.*—The infantile mortality in the 33 principal towns during the year was at the rate of 252 per 1,000, as compared with 233 per 1,000 in the previous year and 227 per 1,000 in the penultimate year. 13,316 deaths from infantile convulsions were registered during the year. During 1918 21 midwives were trained at the De Soysa Lying-in Home, Colombo. The number so trained since September 1, 1909, has been 205. Midwives have been appointed to sixteen Government hospitals in large centres to try and decrease the infant mortality.

8. *Vital Statistics on Estates.*—The mean birth-rate on estates was 52·8 per 1,000, and the death-rate 75·2. The mean birth-rate during 1917 was 34·4 per 1,000, and the mean death-rate 36·4 per 1,000. The principal causes of death were :—

Debility ..	3,936	Infantile convulsions ..	1,726
Diarrhoea ..	1,695	Dropsy ..	231
Anchyllostomiasis ..	1,776	Phthisis ..	292
Pneumonia ..	11,103	Anæmia ..	73
Dysentery ..	1,340	Other diseases ..	8,825

9. *Influenza.*—This disease, an epidemic of which had not visited Ceylon since 1890–91, has seriously affected the vital statistics of the year 1918. Report of its outbreak in Europe had reached Ceylon early in the year, but it was not till about June that the first case began to be recognized. These patients were evidently infected through the port of Colombo, as it would appear that certain craftsmen and labourers working on vessels in the harbour were the first victims. An epidemic, at first confined to the Fort, where the employees of Government offices and business houses were stricken down in numbers, was noticed in June and July. The spread of the disease was rapid, and the gravity of the symptoms increased as the disease increased. By September and October nearly every Province and district in the Island was affected. Notable features of the disease were the rapid onset of pneumonia in a large percentage of cases, mostly of the broncho-pneumonia type. Extreme prostration, which lasted for about two weeks after recovery from the more urgent symptoms, was also a frequent remarkable manifestation, and death from cardiac failure without the existence of severe lung complications was not unfrequently observed. The disease was intensely infective, and relapses and recurrences were not unusual. The energies of the officers of my Department were severely taxed in their efforts to meet the calls upon their services. There being no immunity from the disease, many medical officers, apothecaries, and nurses contracted it, in some cases with fatal results either to themselves or their families. To meet the requirements of the sick and suffering, I was compelled to recruit for temporary service a number of extra persons, such as medical students, dispensers, and even vaccinators. Much credit is due to the energetic and self-sacrificing efforts of superintendents of estates to help and co-operate in combating the disease. Public benevolence and charity was also in evidence, both in towns and rural areas. The following table exemplifies the incidence and mortality of the disease as far as can be demonstrated by returns from hospitals and dispensaries :—

Province.	Number of Cases.	Mortality.	Province.	Number of Cases.	Mortality.
Western Province ..	2,922	597	North-Central Province ..	175	14
Central Province ..	1,528	405	Province of Sabaragamuwa ..	949	193
Northern Province ..	564	67	Province of Uva ..	621	74
Southern Province ..	401	52			
Eastern Province ..	92	14	Total ..	7,894	1,484
North-Western Province ..	642	68			

(Note.—The above figures include pneumonia (lobular), which is a frequent complication in this disease. The cases of pneumonia (lobular) reported in 1917 in Government hospitals was 865, with 329 deaths.)

10. *Malaria.*—This disease, as in preceding years, was accountable for a large amount of the sickness and mortality of the Island, particularly in rural districts in the low-country. A total of 367,854 cases of malarial fever were treated in the hospitals and dispensaries of the Island, as compared with 348,728 the year previous. Of these, 8,154 were treated in hospitals and 359,700 in dispensaries. The mortality in hospitals from malaria was 130. The mortality of dispensary cases is not available. Besides actual cases of malarial fever treated, 1,904 cases of *Malarial cachexia* (*i.e.*, the symptoms and conditions attributable to malarial infection) were treated. The malarial index as computed from examination of the spleens of school children indicated that out of 21,903 children examined, 4,689 were subjects of malarial infection. While no extensive epidemics were reported from eight Provinces, one, the North-Western Province, showed a considerable increase as regards malaria in 1918. The drought during the year was probably an agent in this increase, and the lowering of vitality by the pandemic of influenza was also a factor tending to an increase of infection.

The following table gives the incidence and mortality of malaria as far as can be gathered from hospital statistics :—

	1918.		1917.	
	Number of Cases.	Mortality.	Number of Cases.	Mortality.
Western Province ..	2,023	43	2,429	27
Province of Uva ..	1,257	26	748	12
North-Western Province ..	1,030	16	414	11
Northern Province ..	1,024	11	1,065	13
Central Province ..	885	8	773	13
Province of Sabaragamuwa ..	858	6	860	17
North-Central Province ..	454	10	167	4
Southern Province ..	409	8	370	8
Eastern Province ..	214	2	134	2
Total ..	8,154	130	6,960	107

A large number of cases of malaria are treated in the estate hospitals and dispensaries, and 1,125 lb. and 5 ounces of quinine were distributed free for curative and prophylactic purposes.

11. *Plague.*—The total number of cases reported and treated during 1918 was 202 cases with 172 deaths, as compared with 77 cases with 58 deaths in 1917. No cases of this disease occurred in the Eastern, Southern, North-Central, North-Western, Uva, or Sabaragamuwa Provinces. Ten cases were admitted from the Municipality of Colombo to the Colombo Infectious Diseases Hospital, of whom 9 died, as compared with 77 cases with 58 deaths in 1917. No case of plague occurred in the Western Province outside the limits of the Colombo Municipality. A serious outbreak of the disease occurred at Nawalapitiya in the Central Province. In this outbreak 152 cases, with 103 deaths, occurred. The first case was recognized on March 22. Evidently there had preceded the outbreak an unrecognized epizootic among rats in the town. Effective measures were at once taken by the local Medical Officers and Provincial Surgeon, with the collaboration of the Government Agent and Assistants, the Senior Sanitary Officer, and a sufficient force of police under a police officer. Where necessary, insanitary dwellings were demolished; others were completely and methodically disinfected. A systematic campaign of rat destruction was taken in hand, all dead rats being examined for purposes of discovering the percentage of infection amongst these rodents; 4,843 were examined, and 38 were found infected with

plague. From Nawalapitiya the disease spread to Kadiyanlena bazaars, Kenilworth and Kataboola estates, and to Ginigathena. One fatal case occurred in Gampola town; one on Nayapana estate, Pussellawa. A case which succumbed to the disease in Jaffna was infected in Nawalapitiya. In the year previous one case had occurred in Nawalapitiya and one in Kandy.

12. *Cholera*.—Four cases of this disease occurred in the Island in 1918, as compared with *nil* in 1917 and with 42 in the year previous. One of these cases, at Wellawatta, was a Tamil immigrant from South India, who had presumably been infected before arrival. He was admitted to the Infectious Diseases Hospital. Two cases were landed at Beruwala, arriving from Karikal in South India: both were fatal. There was no extension of the disease from these patients, owing to the rapid and effective measures taken.

13. *Smallpox*.—A total of 240 cases with 37 deaths occurred in the Island in 1918, as compared with 105 cases with 13 deaths in 1917. Of these, 190 occurred in the Northern Province, 48 in Colombo and adjacent localities, and 2 in the Central Province. The extensive outbreak in the Northern Province was evidently the result of infection imported from South India, and unfortunately, owing to an error of diagnosis on the part of the Medical Officer, Mannar, the nature of the disease was not recognized until infection had spread. Removal of all cases to temporary hospitals, segregation of contacts, thorough disinfection of houses, and careful vaccination and re-vaccination of the people in the infected localities eventually resulted in complete suppression of the epidemic. I deputed Dr. E. Langley Hunt, C.M.G., Assistant Principal Civil Medical Officer, and Dr. G. W. R. Fernando, Acting Junior Sanitary Officer, to assist the Provincial Surgeon, Northern Province, in an organized effort to combat the disease, with the result that the spread was speedily checked. In this connection I have to repeat observations made in previous reports that quarantine restrictions as applying to the ports in the Northern Province are ineffectual to check the introduction of infection from South India, and I agree with the Government Agent of the Northern Province that a fast patrol boat is a necessity for the maintenance of stricter quarantine precautions along the coast. The outbreak in Colombo and its environs originated from infection imported from Mesopotamia through a ship's engine-room hand, who developed the disease shortly after landing. This case was not immediately recognized as smallpox, with the result that infection had spread to the town before adequate measures were adopted. Thirty cases occurred within the Municipality, and 10 cases occurred in villages within a radius of ten miles of Colombo. Six cases were landed from ships in the port, and treated at the Infectious Diseases Hospital.

14. *Vaccination*.—The vaccination staff of the Colony consists of 138 trained vaccinators, under the supervision of Provincial Inspectors of Vaccination, and under the administrative control of the Provincial Surgeon. The total number of primary vaccinations performed during the year 1918 was 117,563. Of these, 109,001 were successful, 1,424 unsuccessful, and results not determinable in 7,138. The percentage of successful primary vaccination was 98·71 per cent.

15. *The Government Vaccine Establishment, Colombo*.—The following is an epitome of the work done by this institution during the year 1918. The total number of calves received on hire from the contractor amounted to 371. During the twelve months 357 calves were used for vaccination, and of these, 347 were returned to the contractor. Seed lymph for the vaccination of calves was obtained from the Lister Institute, Madras. A certain amount was also prepared in this establishment. The total number of tubes of calf lymph issued during the year amounted to 102,132.\* Of this number, 4,345 were issued to the Colombo Municipality, and 587 were sold, realizing a sum of Rs. 555·50. A large quantity of lymph was also stored in bulk as a reserve supply. The glycerinated calf lymph was issued to vaccinators in sealed glass capillary tubes. Lymph was also issued in collapsible metal tubes to those stations where a large number of vaccinations are carried out daily. The weekly returns of vaccinators received at this office show that a successful case percentage of 98·73 (primary vaccinations) was obtained with the lymph issued during the year.

16. *Enteric Fever*.—The total number of cases of this disease treated in hospitals and dispensaries during 1918 was 614 with 131 deaths, as compared with 518 cases and 93 deaths in 1917. The following table will serve to demonstrate the case incidence of the disease in Ceylon as far as can be computed from hospital and dispensary statistics, though doubtless the disease is more prevalent than would appear to be the case, as many cases escape recognition by native practitioners and others, and are classed as malarial, &c. :—

	Cases.	Deaths.		Cases.	Deaths.
Colombo, General Hospital	168	53		Northern Province	.. 21 .. 6
Other hospitals in Colombo	41	8		Central Province	.. 85 .. 9
<i>Provincial Stations.</i>					
Western Province	.. 107 .. 37		Province of Sabaragamuwa	18 .. 5	
Southern Province	.. 59 .. 13		Province of Uva	.. 8 .. 4	
			North-Central Province	.. — .. —	
			North-Western Province	.. 14 .. 4	

That the disease is urban rather than rural is exemplified by the fact that Colombo, Galle, Jaffna, Moratuwa, and Kalutara show the greater number of cases. In some towns, e.g., Galle, Moratuwa, Jaffna, the disease may be regarded as endemic, and possibly dependent upon imperfections in water supply.

17. *Dysentery*.—The number of cases treated in hospitals during the year under review was 2,481 with 428 deaths, as compared with 2,883 cases and 620 deaths in 1917. The number of cases treated at dispensaries was 14,380. The disease broke out periodically in a sporadic form in villages and estates, but no extensive epidemic was reported. Where water supplies are liable to surface pollution, dysenteries and diarrhoeas must continue to be of frequent occurrence, especially where fouling of the ground continues. The reduction of the number of cases in the Jaffna jail on the introduction of sterilization of water by chlorinogen is significant of the influence of water infection as a causative agency.

\* During October and November vaccination was almost entirely suspended owing to influenza.

18. *Leprosy.*—The following extract from the report on the Hendala Leper Asylum gives concisely the statistics of that institution for the year 1918:—

*Statistics.*

	Males.	Females.	Total.
Remained on December 31, 1917	.. 351	.. 78	.. 429
Admitted during the year	.. 97	.. 15	.. 112
Discharged	.. 37	.. 6	.. 43
Died	.. 113	.. 10	.. 123
Remained on December 31, 1918	.. 298	.. 77	.. 375

Of the 112 admissions, 95 were new cases. They were in the following stages of the disease:—

Tubercular	.. ..	.. ..	.. 19
Anæsthetic	.. ..	.. ..	.. 45
Mixed	.. ..	.. ..	.. 31
			—
		Total ..	95

The new admissions were from the following Provinces:—

Western Province	.. ..	.. ..	.. 64
Central Province	.. ..	.. ..	.. 10
Southern Province	.. ..	.. ..	.. 10
Province of Sabaragamuwa	.. ..	.. ..	.. 5
North-Western Province	.. ..	.. ..	.. 2
Northern Province	.. ..	.. ..	.. 2
Province of Uva	.. ..	.. ..	.. 2
			—
		Total ..	95

The remaining 17 were re-admissions of absconders.

*Discharges.*—43 were discharged from the asylum; of these, 19 were struck off the books for absconding, 9 were discharged as not suffering from leprosy, 14 were sent to India, 1 was transferred to the Welikada prison, having been convicted and sentenced to six months' imprisonment last October for assault on one of the nursing staff. Of the 19 who absconded, 8 were arrested and brought back by the police, 6 returned of their own accord, and 5 are still at large.

The epidemic of influenza was very violent at this institution. 408 out of 442 inmates were attacked with the disease, and the mortality of 123 was largely due to this disease. The symptoms developed by leper patients appear to have been more severe and acute, with more serious complications, than among persons not afflicted with the disease of leprosy.

In addition to the Hendala Asylum, the Leper Asylum attached to the Kalmunai hospital in the Eastern Province afforded accommodation and segregation to 58 lepers, as against 49 the year previous. The accommodation is insufficient for the demands upon it, and 21 patients are on the waiting list in the eastern parts of the Island. The buildings for the proposed Mantivu leper settlement, on an island on the lagoon near Batticaloa, have not yet been occupied owing to difficulties in connection with the water supply not having yet been overcome. It is hoped that ample provision for the segregation of lepers in the Eastern Province will be provided when this settlement has come into occupation.

19. *Anchylostomiasis.*—The following table indicates the relative prevalence of this disease in the respective Provinces, as far as can be computed from hospital and dispensary returns:—

Province or Institution.	Number of Cases treated.		Mortality in Hospitals.	
	1918.	1917.	1918.	1917.
Western Province	.. 6,925	.. 1,311	.. 184	.. 197
Central Province	.. 5,837	.. 3,237	.. 413	.. 569
Southern Province	.. 1,796	.. 666	.. 85	.. 98
Province of Sabaragamuwa	.. 1,685	.. 1,175	.. 180	.. 232
North-Western Province	.. 1,340	.. 320	.. 58	.. 46
Province of Uva	.. 1,153	.. 1,223	.. 144	.. 277
General Hospital, Colombo	.. 980	.. 466	.. 66	.. 55
Eastern Province	.. 281	.. 153	.. 9	.. 12
North-Central Province	.. 102	.. 33	.. 4	.. 3
Northern Province	.. 76	.. 25	.. 5	.. 2

The above figures, of course, mainly apply to cases of uncomplicated anchylostomiasis, but owing to the almost universal infection with the parasite, especially in the planting districts, and the tendency of the infection to predispose to other diseases, a large number of cases of the disease, while recognized in treatment, are entered on registers under the heading of the intercurrent illness. The following report, with which I have been favoured by Dr. W. Perrin Norris, of the Rockefeller International Foundation, whose untiring and zealous efforts in the suppression of the disease are fully recognized by the officers of my Department, will demonstrate the progress and activity sustained during the year in attempting to combat the infection:—

*The Anchylostomiasis Campaign.*—During the year campaigns have been carried through in the following districts:—Elpitiya, Maskeliya, Haputale, Koslanda, and in the area of the Kelani Valley extending from Talduwa to Hanwella. Community work was also undertaken at the village of Gorakapola (Western Province), where, with a census of 679, 639 were found infected and 600 were treated. In this connection it may be stated that in all 2,971 villagers and bazaar and kaddie keepers were treated during the year in the course of campaign work. In addition, a considerable number of Sinhalese labourers on estates received treatment.

Work in the Matale area and at Dikoya and Bogawantalawa was completed in 1917. It had been contemplated to undertake seven campaigns during 1918, the International Health Board having tentatively agreed to meet the wishes of the Anchylostomiasis Committee and to assist Government to this extent. The

entrance of the United States into the war, however, rendered it necessary to curtail this programme. The Senior State Director, Dr. W. P. Jacocks, and Dr. Eastman returned early in the year to America for military service. In June Dr. J. E. Snodgrass, who had opened the Matale campaign in 1916 (completed by Dr. S. A. Winsor), and subsequently carried through a very successful campaign at Bogawantala, returned to the United States.

Fortunately arrangements had been made in 1917 to detail two Senior Government Medical Officers for training in campaign work, and it is gratifying to be able to report that the work accomplished by them during the year has been very satisfactory. Dr. Winsor, of the International Health Board Service, was in charge of the field work at Elpitiya, Gorakapola, and Maskeliya; Dr. Fitzroy Keyt directed the Haputale-Koslanda campaign; Dr. S. T. Gunasekera that in the Kelani Valley.

As was only to be expected, there was some trouble with the coolies at the opening of the campaigns, but there was little serious opposition. The consensus of opinion among the field officers is that if the superintendent knows his coolies and has their confidence and maintains reasonable discipline, there is no serious difficulty.

It may be pointed out that owing to war conditions many estates have been inadequately staffed, and that in not a few cases the superintendents were new to the estates—an unavoidable state of affairs—in no way facilitating the task of the Field Directors. However, during the year, despite various difficulties, a greater area (more than 250 square miles) was dealt with, and a larger number of coolies were treated and cured than in the previous two years, 50,800 cases having been treated and 44,718 cured. This increase in the work accomplished has been possible owing to the attachment to each campaign of selected Assistant Medical Officers, who, working under the Field Directors, have enabled the latter to extend the areas of operation considerably.

Post-campaign work, on lines previously planned, was started at Matale in January, and the preliminary examination of already treated and cured coolies in that district revealed the fact that a great majority of the coolies has become re-infected. This naturally led to a strong feeling of disappointment, if not actual dissatisfaction, among planters who failed to connect the fact with its obvious cause, namely, the general failure to control soil pollution round the lines, and to get the latrines into general and proper use in 1917.

While it is probable that a small proportion of the re-infection has occurred in the neighbouring villages, there can be no doubt that the main source of re-infection has been the soil pollution still prevalent on estates during that year. In this connection it must be pointed out that during the past two years most of the villages interspersed throughout the Matale area have been sanitized. It is also stated that 75 per cent. of the privies erected are being used by the villagers.

It may also be mentioned that, when starting work in any new area or subdivision, it is not uncommon to have planters state that they have deferred getting the latrines into use until the campaign started. Such a course of action, or rather inaction, necessarily militates greatly against the success of any campaign, and renders re-infection inevitable. It can without hesitation be stated that if the latrines have been in general and proper use at least six months before the opening of a campaign, the extent of re-infection will be very small. The importance of clearing up a zone round each set of lines, exposing the ground freely to the sun, should also be borne in mind. The anchylostome larvæ will soon perish if robbed of shade and moisture. The problem of treating and sanitating the village communities has not been overlooked during the year. Much preparatory work has been done and prejudice reduced. It is expected that much more in this direction will be carried out during the coming year, but, as an earnest of what can be done, it may be mentioned that in a single korale in the Southern Province over 19,000 privies were erected and brought into use in five months this year. This was the outcome of interest shown by the local officials and of educational work in the shape of twenty lantern talks in the vernacular by an officer of the Government Sanitary Branch. Similar work is being done elsewhere.

Commenting on the above, I have to remark that the frequency and extent of re-infection is certainly disheartening. Until superintendents of estates more fully understand and appreciate the effect of their own individual mental attitude towards the problem, and how powers of control, discipline, organization, and the exercise of unceasing vigilance in matters of sanitary supervision of their estates may influence and re-act upon the health, welfare, and lives of the coolies, infection and re-infection are bound to occur. The reports of the Inspecting Medical Officers reveal that, while on some estates there has been a remarkable and sustained improvement as regards sanitation, due to the superintendents' activities, on others, owing to indifference or want of time the powerful aid of the superintendents has not been adequately exercised. It would thus appear evident that the personality of the superintendent and his attitude towards the question of his responsibility and duty in efforts directed towards preventing the fouling of his estate by disease germs are factors which have a most important bearing on any attempts to protect the cooly from the results of his own deplorable habits. It may be observed that, while matters concerning the administration of *curative medicine* have attracted much attention on the part of the planting community, the essentials of *preventive medicine*, as involved in close attention to the primary requirements of sanitation, are lost sight of far too often; while on many estates much effort and much money may have been expended in providing well-constructed lines, efficient drainage, well-built latrines, and improved water supply, &c.; the fact escapes notice that all this effort and money may be wasted where there is no determined, sustained, and *organized routine system* to prevent the daily re-infection of the soil around the lines. I am glad to be able to record that on a few estates, where the importance of this prevention of soil pollution has been recognized, infection and re-infection has practically ceased. A casual glance at the coolies on such estates will convince even an untrained observer that there is a substantial reflex in the healthy, sleek, and contented aspect of the coolies, particularly noticeable in women and children. As Dr. W. Perrin Norris emphasized, six months' freedom from pollution of the soil will result in its ceasing to be a danger to the health and lives of the coolies. When estate managers fully and thoroughly understand that they have duties and responsibilities in the matter of disease *prevention*, the problem will be solved. On every estate, therefore, there should be an organized sanitary vigilance party, whose special duties should be watched and supervised by the superintendent. Negligence and lapses in these matters mean disease and death.

If extra expense is involved by this measure, such expense will have been more than compensated for in a few months by the improved health and, therefore, improved value of the labour force. A sick cooly is a bad worker, and a sick labour force is a poor asset. The death of a cooly from preventable disease is in some degree a reproach to the management of the estate. Before the compulsory provision of latrines on estates was enacted by law, infection was inevitable. Now that latrines are provided by statutory proclamation, infection is *not* inevitable.

20. *Diphtheria* is uncommon in Ceylon. The number of cases treated in hospitals and dispensaries in 1918 was 11 with 6 deaths, as compared with 13 cases and 6 deaths in 1917.

21. *Parangi (Framboesia, or Yaws)*.—The number of cases of this disease treated in the Island at Government hospitals is tabulated below for comparison as to its incidence in the different Provinces :—

Province or Institution.	Number of Cases.	
	1918.	1917.
Western Province ..	318	241
Central Province ..	926	1,337
Northern Province ..	141	123
Southern Province ..	377	240
Eastern Province ..	502	517
North-Western Province ..	1,002	948
North-Central Province ..	455	512
Province of Sabaragamuwa ..	669	695
Province of Uva ..	704	616
General Hospital, Colombo ..	117	130

Specific treatment by arsenious iodide administered by intravenous injection of a standard solution in graduated doses was the rule. This treatment has proved efficacious, but its curative effects are not so speedy and remarkable as the effects of salvarsan and arsено-benzol, which owing to shortage were not available for issue.

22. *Cancer and Sarcoma*.—The number of cases of these diseases treated in hospitals in 1918 was 70, of whom 12 died in hospital. Cases from the Provinces generally proceed to Colombo for operative treatment. The number of cases of malignant disease treated in the General Hospital in 1918 was 40, with a mortality of 9.

23. *Tuberculosis of the Lung (Phthisis)*.—The incidence of the disease in Ceylon as evidenced by hospital and dispensary returns is tabulated below, the total number of cases for the year being 2,782 with 615 deaths, as against 1,862 cases and 569 deaths in 1917 :—

Province or Institution.	Number of Cases.	Number of Deaths.
Western Province ..	1,084	180
General Hospital, Colombo ..	654	207
Central Province ..	342	71
Province of Sabaragamuwa ..	185	36
Province of Uva ..	153	35
Southern Province ..	117	24
Northern Province ..	99	13
North-Western Province ..	97	38
Eastern Province ..	41	8
North-Central Province ..	10	1

The Anti-Tuberculosis Institute, Colombo, has fully justified its existence, and has continued to do much good work. 996 new cases were treated at the institution, and 1,983 visits were paid by out-patients to the institution. 242 domiciliary visits were paid to patients by the professional staff of the institution, in addition to the cases treated at the Colombo Institute. 438 cases were treated at the Ragama Tuberculosis Hospital, 293 of whom were patients from Colombo. The Kandana Institute for the open air treatment of incipient cases was not in occupation during the year, but had neared completion. The Medical Superintendent of the Anti-Tuberculosis Institute emphasizes the necessity for a more rigid enforcement of the by-laws against spitting and expectoration in public places, with a view to minimizing the spread of the disease. Notices in tram cars, railway stations and railway carriages, markets, courts of law, &c., might with advantage be assisted by the occasional prosecution of offenders, to which some measure of publicity being given through the local press, particularly the vernacular press, to such action.

24. *Port Health Precautions, Colombo*.—During the year under review 1,661 British and foreign steamers and 406 sailing craft called at the port of Colombo, and were all inspected. The number of crew examined in the steamers was 108,608, and the number of passengers 72,263. The number of crew in the sailing craft was 3,377, and the number of passengers 127. The largest number of steamers and sailing craft which called at this port was during the month of January, 1918.

In granting or withholding pratique, the system of precautions adopted since the outbreak of plague in Colombo in 1914 were enforced.

Six vessels were placed in quarantine for smallpox infection, one for suspected plague, and one for spotted fever (cerebro-spinal meningitis). No cholera-infected vessels arrived at the port during the year. Minor infectious diseases, e.g., measles, mumps, and chickenpox, were also dealt with by the Port Surgeon.

25. *Disinfection*.—The following is a summary of the work done at the disinfecting and vaccinating station :—

- (a) Disinfection : Passengers, 4,037 ; cargo coolies, 3,721 ; coal coolies, 1,900 ; tally clerks 216.
- (b) Vaccination : The total number of persons vaccinated at the dépôt was 190.

26. *Fumigation*.—Cargo lighters were regularly fumigated, and rat destruction has been systematically carried out during the year. The tanks of water boats were periodically cleaned and disinfected, and certificates to this effect issued by the Port Surgeon after inspection. There were 103 prosecutions for breach of quarantine regulations lodged in the Master Attendant's Court, with 84 convictions. The number of persons convicted, 95.

## SECTION III.—METEOROLOGICAL CONDITIONS.

27. The rainfall was heaviest in the south-west of the Island, being especially heavy in that district lying between and slightly to the west of Ratnapura and Nawalapitiya. The highest rainfall for the year was recorded at Carney estate, a little to the north-east of Ratnapura. Here rain falling on 233 days amounted to 199·36 inches. Though the rainfall was heaviest in the south-west district, it was here much below normal. The rainfall was below normal south of Puttalam in the west, the south, and east. Centrally from the north of the hills to the Jaffna peninsula the country experienced a rainfall above the average. In the north the rainfall, however, was unsatisfactory, as cyclonic precipitation experienced from November 14–19 accounted for more than half of the year's total. On the whole, the year's rainfall was unsatisfactory. Thunderstorms in number were well up to the average, but the resulting precipitation not as heavy as is usually experienced. Humidity was below normal, especially to the north.

Temperature below the normal was experienced during the first four months, while that experienced throughout February was phenomenally cool. The extremes of temperature experienced during the year were in all cases within the record figures.

The wind both in strength and in direction did not vary greatly from that usually experienced, but, on the whole, the strength of the monsoon currents was below the average.

Air pressure for the year was above that of the average, being especially high in February and high throughout the south-west monsoon months.

Meteorologically the year was on the quiet side.

## SECTION IV.—THE SANITARY BRANCH OF THE MEDICAL DEPARTMENT.

28. This branch of the Department is officered and manned by the following staff :—One Senior Sanitary Officer, one Acting Junior Sanitary Officer, three Assistant Sanitary Officers (one appointed May, 1918), Sanitary Engineer and four surveying coolies, Sanitary Superintendent, five disinfecting orderlies, four rat-catching coolies, and sixty-five Sanitary Inspectors. Two Sanitary Inspectors were on active service in Mesopotamia. One Sanitary Inspector resigned, one was dismissed, and one died.

A class of 46 candidates, including 12 sent from Local and Sanitary Boards, was trained during the year. Only 36 obtained certificates after examination.

The following is a summary of work done during the year under review :—154,457 premises were inspected during the year, of which 20,190 were found insanitary. 4,513 actual mosquito-breeding places were discovered and dealt with. There were 1,289 prosecutions with 1,261 convictions in respect of breaches of sanitary rules and regulations, the fines amounting to Rs. 6,154·75. The prosecutions are only sanctioned after inspection by the Sanitary Officers, Government Agents, or Assistant Government Agents.

29. *New or Re-constructed Buildings.*—2,232 applications were dealt with, and permits granted in the Board towns of the Western Province.

30. *Infectious Diseases.*—The following infectious diseases were reported on and prophylaxis carried out :—

	Cases.
Dysentery	209
Chickenpox	1,040
Enteric Fever	282

31. *Sanitary Conveniences.*—Public latrines of an approved type were constructed at Government expense in the Sanitary Board towns of Welikada, Ja-ela, Veyangoda, Puwakpitiya, Henaratgoda, and Kochchikade.

In the Colombo District 2,397 pit latrines and 17 dry-earth latrines, and in the Kalutara District 760 new private latrines, were constructed in the rural areas.

*Matara.*—Last year there were only 1,000 privies in the district, and for the first six months of this year only 500 were added, but with the efforts of the Assistant Government Agent and the Mudaliyars there was a total of 22,800 at the end of the year.

*Matale.*—5,431 latrines were installed in the villages in connection with the Anti-hookworm Campaign, as compared with 2,424 for the year 1917. These results are principally due to the efforts of Dr. M. de Costa, Assistant Sanitary Officer.

*Minuwangoda.*—In September last latrine installation work was especially taken in hand in this area with a view of starting an Anti-hookworm Campaign. During this short period as many as 2,124 latrines have been put up, and 453 are under construction.

32. *Sanitation of Schools* is receiving attention. Two latrines have been put up for two schools in Elpitiya, Southern Province, at Government expense.

33. *Domestic Water Supplies.*—10,872 wells were inspected, of which 5,283 were found adequately protected against contamination. 508 wells were sterilized in connection with communicable diseases. Fourteen type plan wells were provided at Government expense for towns in the Western Province, and two existing public wells were improved.

34. *Scavenging.*—The scavenging of public and domestic refuse is being carried out in all the Board towns of the Island, with the exception of a few that have been but recently brought under the Sanitary Boards Ordinance and have not yet accumulated sufficient funds for the employment of scavenging coolies.

35. *Licensed Traders.*—These are gradually being made to conform to the rules and regulations affecting them.

36. *Town Planning.*—Surveys and improvement schemes are being carried out at Kelaniya, Hanwella, Dehiwala, Nugegoda, Minuwangoda, Kesbewa, and Veyangoda.

37. Inspection of the principal towns in the Island was made during the course of the year, and recommendations for their improvement sent to the respective Chairmen.

## SECTION V.—GENERAL SANITARY CONDITIONS IN CHIEF TOWNS.

38. *Colombo*.—Details of the sanitary conditions of this city will receive full notice in the report of the Medical Officer of Health of the Colombo Municipality. The medical institutions officered by the Civil Medical Department consist of (1) the General Hospital, (2) the De Soysa Lying-in Home, (3) the Victoria Memorial Eye Hospital with the Grenier Ear and Throat Infirmary, (4) the Colombo Lunatic Asylum, (5) the Lady Havelock Hospital for Women, (6) the Lady Ridgeway Memorial Hospital for Children, (7) the Borella Convict Hospital, (8) the Infectious Diseases Hospital, (9) the Police Hospital, (10) the Bacteriological Institute, (11) the Civil Medical Stores, (12) the Branch Hospital for Women, (13) the Leper Asylum, Hendala, (14) the Anti-Tuberculosis Institute, (15) the Pasteur Institute. The total number of beds provided in the Colombo hospitals is 929, not inclusive of the Lunatic and Leper Asylums. In addition to hospitals, there are the following out-patient institutions :—(1) The Out-patient Department of the General Hospital, (2) the Out-patient Department of the Victoria Memorial Hospital, (3) the Out-patient Department of the Lady Havelock Hospital and Branch Hospital for Women in Borella, (4) the Urugodawatta (Grandpass) Outdoor Dispensary, (5) Mutwal Outdoor Dispensary, (6) the Police Outdoor Dispensary. The total number of out-patients treated during the year at the above institutions amounted to 61,054 patients, who paid 145,230 visits.

39. *Kandy*.—The sanitation of this town is satisfactorily controlled by the Municipality. Its water supply is excellent, its drainage improved, and scavenging well effected. Its medical requirements are supplied by the Civil Hospital, with 204 beds, inclusive of the Eye Infirmary ; the Jail Hospital, with 72 beds ; and the Outdoor Dispensary, at which 9,861 patients attended during the year.

40. *Galle*.—Owing to war and shortage of funds the sanitary deficiencies of this town could not receive much attention during the year. The hospital is provided with 104 beds, which, however, is sometimes short of requirements. There were 13,737 patients treated in the Outdoor Dispensary.

41. *Jaffna*.—Defective sanitation in this town continues, better drainage, water supply, and disposal of excreta being matters requiring the expenditure of more funds than appear to be available under present conditions. Soil pollution is common.

42. *Batticaloa*.—The pipe-conducted water supply has conferred upon this town a great advantage ; but drainage, disposal of refuse, and other requirements are dependent upon the expenditure of more funds than are at present available. A hospital with 50 beds and an outdoor dispensary, at which 10,585 patients were treated, supplied the medical necessities of the town.

43. *Anuradhapura*.—The water supply, as in previous years, was defective, but otherwise sanitary effort had improved. The hospital has 82 beds, and 11,488 patients were treated in the outdoor dispensary.

44. *Kurunegala*.—Sanitary activity in this town continued, the water supply being, as in previous years, defective. There are 170 beds in the hospital, and 13,556 patients were treated in the outdoor dispensary.

45. *Badulla*.—Effective scavenging and comparatively good drainage, together with an abundant and pure water supply, makes this town compare favourably with other provincial towns in Ceylon. The hospital accommodation is 149 beds ; 5,722 patients were treated in the outdoor dispensary.

46. *Ratnapura* has an insufficient water supply from pipes, and there is a tendency to over-crowding. There are 132 beds in the hospital ; 6,836 patients were treated in the outdoor dispensary.

## SECTION VI.—GENERAL.

47. *Administration : Hospitals, Asylums, and Dispensaries*.—Besides the Lunatic Asylum, Colombo, and the Leper Asylum, Hendala, which are capable of accommodating respectively 514 and 406 patients, there existed in 1918 84 Government hospitals with accommodation varying from 12 to 687 beds. These hospitals are well equipped with modern conveniences and appliance, and officered by qualified medical men, the larger ones having also a trained staff of nurses. The following new buildings were completed in the year :—Kandana Sanatorium for Consumptives ; Apothecary's quarters, Dambulla ; quarters for Medical Officer and operating room, Nawalapitiya ; first and second class paying wards, Jaffna hospital ; dispensary at Mulliyaveli ; dispensary at Kattankudi ; dispensary at Madampe ; new building, Alutnuwara hospital, Aranayaka hospital, Kahawatta hospital ; Infectious diseases hospital, Ratnapura ; maternity wards at Karawanella and Balangoda ; quarters for District Medical Assistant, Visiting Apothecary, and Attendants' isolation ward and new mortuary at Balangoda. The following buildings were in progress :—Quarters for Visiting Apothecary, Dolosbage ; Udugama hospital ; mortuary, storeroom, and ward, Mahamodara hospital ; Smallpox hospital, Mandapam ; Tanamalwila dispensary ; quarters for Visiting Apothecary, Second Apothecary, and Steward, Karawanella ; new hospital in Agrapatana ; Leper asylum in Batticaloa ; and some additions to the Dandagamuwa hospital.

48. The following report by the Medical Superintendent of the General Hospital, Colombo, is interesting and instructive :—

1. On December 31, 1917, there were left 680 patients in hospital: 35 in the paying section and 645 in the pauper section.

2. During 1918 the total number of admissions was 10,931 ; of these, 878 admitted to the paying wards and 10,053 to the pauper wards.

3. Of the 913 under treatment in the paying wards, 802 were discharged, 60 died, and 51 remained on December 31, 1918. Of the 10,698 under treatment in the pauper wards, 8,737 were discharged, 1,432 died, and 529 remained on December 31, 1918. The average daily sick in hospital was 43·18 in the paying wards and 610·45 in the pauper wards.

4. The maximum and minimum number of patients in hospital on any one day during the period under review in the paying and pauper sections respectively was as under :—

*Pauper Section.*  
Maximum : 649 on October 7, 1918.  
Minimum : 507 on April 24, 1918.

*Paying Section.*  
Maximum : 57 on December 18, 1918.  
Minimum : 26 on May 5, 1918.

5. Of the 10,053 admitted in 1918 to the pauper wards, 4,544 were surgical cases and 5,509 were medical cases.

6. The number of surgical operations performed in 1918 was 1,829, exclusive of 43 minor operations in the Out-patient Department. Of these 1,829 operations, 219 were done in the paying section theatre.

7. The following table gives a comparison with recent years as regards the number of cases under treatment, the percentage mortality, and the daily average number in hospital in the paying and pauper sections, respectively :—

Year.	Cases under Treatment, Paying Section.				Daily Average Sick.	Cases under Treatment, Non-paying Section.				Percentage Mortality.	Daily Average Sick.
	Cases.	Deaths.	Percentage Mortality.			Cases.	Deaths.	Percentage Mortality.			
1910	816	61	7·4	..	40·85	13,517	1,177	9·13	..	447·41	
1911	862	71	8·2	..	42·62	14,537	1,500	10·03	..	502·51	
1912	925	61	6·5	..	42·63	14,632	1,431	9·01	..	568·20	
1913	978	44	4·5	..	41·97	14,451	1,324	9·01	..	611·06	
1914	994	50	6·3	..	42·68	12,453	1,269	9·68	..	590·79	
1915	907	65	5·3	..	40·94	10,703	1,138	10·63	..	538·31	
1916	909	63	6·9	..	41·18	12,310	1,415	11·49	..	622·27	
1917	814	35	4·2	..	41·30	12,136	1,256	10·34	..	670·49	
1918	913	60	6·5	..	43·18	10,698	1,432	13·4	..	610·45	

8. As regards particular diseases, the following table shows their comparative prevalence and mortality during the past few years as shown by hospital admissions :—

	1910.		1911.		1912.		1913.		1914.		1915.		1916.		1917.		1918.	
	Cases.	Deaths.																
Acute pneumonia ..	328	176	427	196	373	167	274	111	221	104	226	104	357	177	358	136	*1176	389
Pulmonary Phthisis ..	1717	201	1034	209	728	221	640	227	502	227	417	234	581	276	319	178	569	207
Anchylostomiasis ..	548	46	652	66	472	51	742	74	417	77	315	36	360	49	408	55	576	66
Malaria ..	1882	4	1976	21	2154	19	1438	16	1565	23	1118	5	977	11	764	15	535	13
Dysentery ..	435	77	414	59	387	63	284	36	212	26	231	36	268	45	222	29	138	29
Enteritis and Diarrhoea	764	254	1161	315	1146	274	794	216	501	188	376	136	425	156	409	112	312	84
Enteric Fever ..	363	69	431	88	256	62	173	58	97	29	186	50	261	83	174	42	163	53
Appendicitis ..	69	4	75	5	57	8	95	3	90	5	132	4	117	4	144	2	110	6

\* Includes cases of influenza in 1918.

In the latter part of 1918 the pandemic of influenza raging all over the world became widespread in Ceylon. During September, October, and November a large number of such cases, many complicated with pneumonia, were admitted. In the figures given in this section the influenzal pneumonia are not distinguished from the ordinary lobar pneumonia, of which from 200 to 300 are admitted each year. In three months upwards of a thousand cases were admitted, the great majority of them to the non-paying wards. This epidemic entailed a severe strain on the nursing staff of that section, especially as many of the attendants became infected.

9. *Review of the past Ten Years.*—The year ended December 31, 1918, completes a period of ten years since the first appointment of a Resident Medical Superintendent, and it may be of interest to indicate the additions, alterations, and improvements made to the buildings of the General Hospital during that time :—

- (1) Completion of the non-paying section operating theatre block, commenced in 1908, which comprises two excellent operating rooms, an anaesthetic room, a storeroom, and a room for the theatre Sister.
- (2) The ward blocks for male and female diarrhoea cases were fly-proofed.
- (3) The kitchens (4) were fly-proofed, and their lighting and ventilation much improved.
- (4) The latrines were fly-proofed. Sinks and gas heaters to supply hot water were provided in all wards ; formerly very few wards were so equipped.
- (5) All pail latrines have been gradually abolished, and a complete new water-carriage system of sewage disposal installed throughout the hospital.
- (6) A new out-patient block has been erected, with waiting hall, consulting rooms, dispensary, dressing rooms (male and female), operating theatre, apothecaries' quarters, and telephone sub-exchange downstairs, and quarters for twelve house officers upstairs.
- (7) New mortuaries and a post-mortem room were erected.
- (8) A block of six wards, together with the necessary kitchen and storerooms, for the accommodation of the chronic incurable cases and of convalescent cases was erected on an adjacent plot of land acquired for the purpose. This block accommodates 200 cases.
- (9) A block of nine single rooms for paying patients and a Sister's duty room was erected at the expense of the Hon. Mr. W. H. Figg—a most generous and welcome gift.
- (10) A new operating theatre for the paying section was erected ; its design and construction are excellent.
- (11) A commodious new block for the housing of the Religious Sisters was erected on the ground near the wards for chronic incurable cases.
- (12) Improvements have been effected to the quarters for the European Sisters and to the quarters for Ceylonese nurses.
- (13) A small ward of ten beds in the non-paying section for female surgical cases has been enlarged, so as to take twenty beds.
- (14) The X'ray Department was re-equipped through the generosity of G. Sammugam, Esq., J.P., and brought into active service.
- (15) Quarters for a Resident Medical Superintendent were erected.
- (16) The hospital grounds have been much improved in appearance and upkeep.

10. *Plans for the Future.*—It had been decided in 1914 that the time had come when it was necessary that the whole of the wards in the non-paying section should be rebuilt, for they are antiquated in design, deficient in the necessary annexes, and irregularly scattered over the grounds. The outbreak of the great war made it necessary, for financial reasons, that this scheme should be deferred, and some of the improvements referred to above have made it possible to wait for a few more years. This rebuilding of the old hospital must, however, be carried out at a later date, so that hospital wards constructed on modern lines may be provided for this class of patients.

In the non-paying section additional accommodation in the form of a ward for acute medical cases in women should be provided for at the earliest possible date, as the only two wards available for such cases are constantly overcrowded. Further, it is very desirable that two additional wards, one for males and one for females, should be added to the block for chronic incurables and for convalescents, as this will permit of the acute wards being relieved of such cases and used for their proper purpose, as well as increasing the total number of beds available, which is very necessary. It is to be hoped that the single ward may be started this year, and the two wards next year.

As regards the paying section, the additional block of single rooms provided by the generosity of the Hon. Mr. W. H. Figg should suffice to meet the requirements of the class of patients who pay for such rooms for some time to come. There is, however, need for further accommodation in wards—for males and females—for those who cannot afford to pay the charges for a single room. The accommodation available in the Seamen's Ward is very short of the demands on it. Perhaps some generous benefactor will provide for more, as a token of gratitude for the noble part played by the mercantile marine in the war.

11. *Expenditure and Receipts.*—The receipts from patients in the paying section were Rs. 60,420, and the expenditure was Rs. 341,395. The receipts on behalf of certain patients in the pauper section were Rs. 3,695, and the expenditure Rs. 97,674·42. The expenditure in both sections covers the cost of diets, fuel, light, and equipment, and the salaries of attendants and servants, but does not include the salaries of the medical and nursing staff, nor the cost of drugs and dressings.

49. *The Colombo Lunatic Asylum.*—This institution, as has been the case for some years past, falls short of requirements as regards accommodation. The completion of the new asylum, now in process of construction at Angoda, is looked forward to. The following statement exhibits in tabular form the number of inmates of the Asylum, including patients sent to the House of Observation, during the year 1918:—

	Males.	Females.	Total.
Remained on December 31, 1917	.. 677	.. 353	.. 1,030
Admitted during 1918	.. 469	.. 465	.. 934
Total treated	.. 1,146	.. 818	.. 1,964
Discharged ..	.. 312	.. 138	.. 450
Deaths ..	.. 118	.. 47	.. 165
Remaining ..	.. 716	.. 388	.. 1,104

During 1918 there were 245 males and 122 females admitted, being 15 males less and 17 females more than were admitted in 1917. The total number treated in 1918 is 907 males and 469 females, or 1,376, compared with a total of 867 males and 441 females in 1917, being an increase of 40 males and 28 females, or 68 patients in all.

During the year 104 males and 49 females were discharged, compared with 133 males and 51 females discharged in 1917, being 29 males and 2 females less than were discharged the previous year.

There were 157 deaths during the year (113 males and 44 females), compared with 115 for 1917 (72 males and 43 females), being an increase of 41 males and 1 female. There were 34 deaths from phthisis and 18 from pneumonia. Some of these pneumonia were influenzal, and some due to beri-beri. Overcrowding and the recent epidemic of influenza are largely responsible for so many deaths.

The daily average number resident in the Asylum was 682·53 males and 362·67 females.

The largest number present on any one day was 703 males and 375 females, or 1,078 in all, compared with 656 males and 350 females, or 1,006 in all, for 1917; and the lowest number resident on any one day for 1918 was 651 males and 338 females, or 989 in all, compared with 600 males and 335 females, or 935 in all, for 1917.

50. *The House of Observation.*—The year opened with 15 males and 6 females, compared with 18 males and 5 females for 1917. During the year 267 male cases and 111 female cases were sent for observation, being 21 cases less males and 21 more females compared with 1917, the total number, 378, being the same. These 378 cases were distributed among 224 male persons and 98 female persons, due to the fact that any one person may be admitted more than once during the year for observation. The total number under observation was 282 males (239 persons) and 117 females (104 persons), or 399 cases in all (343 persons). Of these 399 cases, 132 males and 71 females were transferred to the Asylum, 119 males and 31 females were discharged, 5 males and 3 females died, leaving 26 males and 12 females, or 38 in all, in the House of Observation on December 31, 1918.

The daily average in 1918 for the Asylum, including persons under observation for insanity, was 689·54 males and 473 females, totalling 1,062·97, as compared with 654·61 males and 342·62 females, totalling 997·22 in 1917. The largest number of inmates was 1,110, and the lowest 1,011, as compared with 1,033 and 964, respectively, in 1917. Towards the latter part of the year influenza broke out among the patients and the staff. In all there were 192 cases, with 6 deaths among the patients, mostly due to pneumonia and cardiac failure. In January a small outbreak of beri-beri was discovered, overcrowding being possibly a contributory factor.

A new ward 100 feet by 40 was erected to supplement the accommodation. The male patients appear to have been industriously occupied in making sundry articles, such as fancy baskets, linen baskets, coir articles, door rugs, and in carpentry; while the females occupied their time by making numerous useful articles for other institutions, such as hospital clothing, sheets, baby linen, mattress covers, bed clothing, &c., and also contributed articles to the Queen Mary's Needlework Guild. The interest and supervision exercised by the matron of the institution is very praiseworthy.

51. *The Infectious Diseases Hospital, Colombo.*—The following table will serve to demonstrate the incidence and mortality from infectious disease in the Municipality of Colombo, the environs of Colombo, and cases landed from vessels in the harbour in comparison with the year previous:—

Disease.	1918.			1917.		
	Number treated.	Deaths.	Number treated.	Deaths.		
Smallpox ..	.. 46	.. 10	.. 5	.. 2		
Cholera ..	.. 1	.. —	.. —	.. —		
Plague ..	.. 10	.. 9	.. 77	.. 58		
Diphtheria ..	.. 4	.. 2	.. 7	.. 2		
Chickenpox ..	.. 351	.. 1	.. 506	.. —		
Measles ..	.. 18	.. 1	.. 156	.. 1		
Mumps ..	.. 15	.. —	.. 22	.. —		
Pneumonia ..	.. 3	.. 1	.. 5	.. 2		
Acute diarrhoea ..	.. 2	.. —	.. 5	.. —		
Other diseases ..	.. 61	.. 1	.. 58	.. —		

As pointed out in previous reports, this hospital, both in situation and construction, falls short of the modern requirements of the city of Colombo.

52. *The Convict Hospitals.*—These consist of the Borella Convict Hospital, Colombo, and the Mahara Jail Hospital, and the hospitals attached to jails in Kandy, Negombo, and Jaffna. The general health of prisoners during the year was good, taking into consideration the influenza outbreak. The total number of patients treated at the Borella Convict Hospital in 1918 was 1,807, with a mortality of 44, and a daily average of 43·66 patients.

53. *The Police Hospital, Borella.*—This hospital has accommodation for 27 patients. The number of in-patients in 1918 was 1,495, and 6,833 out-patients were treated.

54. *The De Soysa Lying-in Home.*—1,749 patients, as compared with 1,739 in the previous year, were treated in this hospital, with a mortality of 87, as compared with 58 in 1917. The deaths were due in 45 cases to the accidents of maternity, in 11 to puerperal causes, and in 31 cases to non-puerperal causes, of which pneumonia, kidney disease, and anchylostomiasis were the main factors. 171 obstetric operations were performed. 1,465 children were born, including 34 twins and 1 triplet. 69 deaths occurred among infants, the percentage mortality being 5·71. 135 paying patients were treated, resulting in the sum of Rs. 5,389·17 being credited to revenue. The institution continues to do excellent work in the training of medical students and midwives. A new building to accommodate 22 pupil midwives was completed during the year.

55. *The Lady Havelock Hospital for Women.*—849 patients were treated at this institution in 1918, as compared with 868 the year previous. One of the wards was closed for certain necessary improvements for about three months, and this resulted in many patients being referred to other institutions for treatment. The daily average sick was 28·65. The mortality was 7·5 per cent. 253 surgical operations were performed by the Lady Surgeon in charge, mostly special gynaecological operations. As a training institution for nurses, this hospital has rendered valuable service, 21 new pupil nurses being admitted during the year, and 14 nurses transferred to other Government medical institutions.

56. *The Lady Ridgeway Block.*—This institution for the treatment of infants and small children is becoming more popular every year. 920 patients were treated in 1918, as compared with 757 in 1917. Unfortunately the practice of resorting to hospital only when the little patients are *in extremis* was too frequent. The daily average was 40·46, and the mortality rate 27·8.

57. *The Victoria Home for Incurables.*—This deserving charitable institution had 73 inmates remaining at the end of the year 1917, and 36 were admitted during the year, 68 inmates being left at the close of the year 1918. Increased accommodation is a great desideratum.

58. *The Bacteriological Institute, Colombo.*—4,525 bacteriological examinations were made during the year 1918, as compared with 6,924 the year previous.

59. *The Pasteur Institute.*, under the direction and control of Dr. Lucius Nichols, Director of the Bacteriological Institute, was opened in April, 1918. The following is an epitome of its work during the 10½ months of its existence. 311 persons bitten by rabid dogs, or dogs suspected to be rabid, underwent anti-rabic inoculation. Up to date there has been no information of failure to ensure protection from hydrophobia in those inoculated. 133 Sinhalese, 112 Tamils, 16 Europeans, 6 Moors, and 1 Parsee were treated. Two cases of hydrophobia that had not received protective inoculation were treated, but both proved fatal. The brains of 97 dogs suspected to be rabid were examined; of these, 42 were from towns and districts in the Western Province, 31 from the Central Province, 13 from the Province of Sabaragamuwa, 5 from the North-Western Province, 3 from the Southern Province, and 1 each from Uva and the Eastern Provinces. Microscopic evidence proved that 47 of these brains were from rabid dogs, and animal inoculations resulted in 11 being proved positive for rabies. Seventeen brains were unfit for examination owing to defective preservation, and 2 were at time of report undetermined. Of the cases prophylactically treated, 97 were persons bitten by dogs diagnosed as positively suffering from rabies, 5 were cases in which canine brain examination had a negative result, 11 were treated on description of symptoms of the suspected dogs, 8 on veterinary surgeons' diagnosis of canine symptoms, and 191 without any previous diagnosis of canine rabies. Of the total 311 cases treated, 115 ran a definite risk of developing hydrophobia, and 191 were doubtful. 58 rabid dogs had bitten 96 persons.

60. *The Ceylon Medical College.*—The following are the statistics of the Medical College:—

(1) Number of Medical Students on December 31, 1917 ..	190	(3) Number of Medical Students passed in 1918 ..	25
Number of Apothecary Students on December 31, 1917 ..	82	Number of Apothecary Students passed in 1918 ..	19
(2) Number of Medical Students admitted in 1918 ..	33	(4) Number of Medical Students left in 1918 ..	8
Number of Apothecary Students admitted in 1918 ..	29	Number of Apothecary Students left in 1918 ..	7
		(5) Revenue from October 1, 1917, to July 31, 1918, Rs. 41,230·50.	
		(6) Expenditure from October 1, 1917, to September 30, 1918, Rs. 71,858·85.	

61. *The Civil Medical Stores, Colombo.*—The scarcity and high cost of drugs and medical appliance consequent upon war conditions continued during the year, and seriously affected supply to institutions, &c. The following is a summary of the transactions of the Medical Stores during 1918 :—Cost of drugs, chemicals, instruments, and repair of instruments and appliances, Rs. 433,352·45 ; cost of transport of the same to institutions, Rs. 3,973·26 ; incidental expenditure, stationery, printed forms, binding, &c., Rs. 11,056·70 ; totalling Rs. 448,382·41. The sum of Rs. 4,269·85 was realized by sale of medicines to estates, sale of unserviceable articles, thermometers to Government officers, and value recovered for loss or damage of instruments issued to institutions. 71,336 ounces of quinine, costing Rs. 124,430·60, were issued from the stores, out of 113,984 ounces received, at a cost of Rs. 208,071·50. Rs. 13,829·42 worth of drugs and instruments were supplied to Government Departments other than the Medical Department. Rs. 253,196·71 was expended in the purchase and preparation of opium, and Rs. 1,866·46 in expenses incidental to the same. Rs. 7,317·15 was recovered by the Stores from the sale of opium preparations.

#### SECTION VII.—MEDICAL AID TO IMMIGRANT COOLIES.

62. In my annual report for 1917 I detailed the sanitary precautions and medical care of immigrant coolies from their detrainment at Mandapam Camp to their detrainment at their terminal station on the Ceylon Railway. The Mandapam Emigration Dépôt is administered by the Chairman of the Plague Committee, and during the year under review was under the superintendence of Dr. Donald Schokman, acting for Mr. Gordon Cran, absent on war service. A detailed report on this highly efficient emigration camp will no doubt find a place in the annual report of the Department responsible for its administration. During 1918 85,441 persons passed through Mandapam Camp, as compared with 93,148 the year previous. Of these, 44,010 were estate labourers, as compared with 46,276 in 1917. The rest were miscellaneous Indian emigrants or other passengers. The falling off in numbers was the result of restrictions on emigration imposed by the Indian Government. The number of persons arriving at Mandapam, but interdicted from leaving India under these restrictions, amounted to nearly 5,000 during the year. No case of plague occurred at the camp. A total of 21 cases of cholera, of which 17 proved fatal, occurred at the camp during the year in thirteen separate outbreaks. The fact that no cholera was imported to the planting districts or elsewhere in Ceylon during the year is testimony to the effectiveness of the precautions taken at the Emigration Camp. Fifteen cases of smallpox occurred, 8 of which were estate coolies, 3 miscellaneous passengers, and 4 among the camp staff. 110 cases of influenza occurred, mostly during June, July, and August.

63. *Government District Hospitals in Planting Areas.*—There are 50 such hospitals, capable of accommodating 4,047 patients. These hospitals are staffed with fully qualified medical officers, nurses, and attendants, and are up to date in equipment. Out-patient departments in connection with district hospitals are largely used by the labour force and villagers of the districts. There are 74 outdoor dispensaries, in addition to the above, unconnected with hospitals. Medical officers pay domiciliary visits to patients in cooly lines when summoned by superintendents in cases the conditions of which do not admit of transport to hospital or dispensary.

64. *Estate ("Rebate") Hospitals.*—There are 58 of these hospitals in the different planting districts, built, equipped, and staffed at the expense of the estate. These hospitals fulfil a very useful purpose in minor and chronic illnesses. Estate coolies have always evinced a disinclination to be removed far from their homes when ill, and as medical treatment, nursing, and dieting cannot be effectually provided in cooly lines, it has been the policy of Government to encourage the establishment of these hospitals by payment of rebate on export tax in proportion to the efficiency of the medical and sanitary provision made by the estate. I am glad to report that there has been progressive improvement in these hospitals, some of which are now excellent in their design, equipment, and method.

65. *Estate Dispensaries.*—Free grants of drugs to 432 dispensaries were made during the year, at a cost of Rs. 148,068.

66. *Latrines on Estates.*—The compulsory provision of latrines on estates has to a certain extent lessened the soil pollution, hitherto so common on all estates; but I regret to observe that soil pollution still continues on estates where lax discipline and faulty supervision or want of systematic effort exists. This is far too frequent, and has been animadverted on in an earlier paragraph on ancylostomiasis.

67. *Sanitary Inspection of Estates.*—During the year about 300 estates were visited by the two Inspecting Medical Officers appointed for the purpose, the sphere of their activities being in the Western, Southern, and Central Provinces. Reports on the sanitary conditions are made by these officers, and all defects and shortcomings discovered are brought to the attention of the estate superintendents and agents, who are requested by letter from me to remedy defective conditions and effect such alterations and improvements as may be indicated by the Inspecting Officers within a reasonable time. It is satisfactory to record that on many estates, notwithstanding temporary financial stringency, there has been a marked improvement in attention to cooly health and welfare. On the other hand, on many estates, perhaps as the result of adverse financial conditions, there was a tendency to economy of effort and of expense, with the result that the neglect of past years was not adequately remedied. On the whole, however, I think I may predict that, as the attention of planters to matters of cooly health and welfare is increasing, and as the preventability of disease is better understood, there will be a more generous outlay on the part of those responsible for estate finance, and more careful and systematic supervision on the part of those responsible for health conditions on estates. Planters are becoming more alive to the value of their human asset in the cooly, and are becoming more anxious as to their welfare. The establishment of crèches for the care of infants and small children, with the provision of diets, is, I am glad to report, receiving more attention.

68. *Number of Estate Labourers treated in Government Hospitals.*—Total number of days estate labourers stayed in hospital, 455,717. Total number of births and deaths on estates was 25,747 and 27,233, respectively.

69. *Inspection.*—In addition to my periodical tours of inspection of Government medical establishments, every hospital and dispensary is visited and reported upon by the Provincial Surgeon.

Visits and reports were also made by unofficial visitors delegated by the Planters' Association for the planting districts and by Government Agents and other senior officials who may have passed through the stations or districts during the year.

70. *Food Supply for Hospitals.*—As in previous years, the system of dieting through the agency of contractors has worked satisfactorily. All food is inspected by responsible officers before and after cooking.

71. *Strength of the Medical Department.*—The following was the strength of the Medical Department during the period : 1 Principal Civil Medical Officer ; 1 Assistant Principal Civil Medical Officer ; 1 Accountant ; 2 Inspecting Medical Officers ; 4 Medical Superintendents ; 9 Provincial Surgeons ; 173 Medical Officers ; 2 Anaesthetists ; 1 Female Medical Practitioner ; 314 Apothecaries ; 9 Inspectors of Vaccination ; 139 Vaccinators, including 7 Female Vaccinators ; 1 Hospital Assistant ; 34 Hospital Stewards ; 1 Bacteriologist ; 1 Assistant Bacteriologist ; 1 Superintendent, Civil Medical Stores ; 1 Assistant Superintendent, Civil Medical Stores ; 1 Senior Sanitary Officer ; 1 Junior Sanitary Officer ; 4 Assistant Sanitary Officers ; 1 Sanitary Engineer ; 1 Sanitary Superintendent ; 67 Sanitary Inspectors ; 29 European Matrons and Trained Nurses ; 55 European Nursing Sisters (Religious Sisterhoods) ; 222 Ceylonese Matrons and Nurses, including 42 pupil nurses ; 5 overseers ; 2 pay agents ; 1 bookbinder ; 70 peons, coolies, &c. ; 4 laboratory assistants ; 2 chauffeurs ; 14 opium clerks ; 26 opium sellers ; and 1 opium storekeeper.

72. *Officers on Leave.*—Eight Medical Officers who received temporary commissions in the Royal Army Medical Corps are still on war service. Medical Officers who proceeded to Europe to prosecute their studies are still on leave. Mr. W. C. H. Tripp, Accountant, Medical Department, who went on leave in May, 1916, has also received a commission in the Army. Three other Medical Officers had leave out of the Island. The total number of officers of the Department on war service on December 31, 1917, was 11, including 2 officers of the Medical College.

73. *Changes in the Department.*—Drs. F. Vethcan and L. A. Ekanayaka, Medical Officers in Grade I., died on May 1, 1918, and April 8, 1918, respectively. Dr. A. E. A. Poulier, Medical Officer, Grade II., who had proceeded to England on long leave to prosecute his studies, died there of influenza on October 27, 1918. Drs. W. S. Tirimane and S. J. H. L. de Heer, Medical Officers in Grade II. and Grade III., respectively, died in October, 1918, having fallen victims to the epidemic of influenza that was prevailing in Ceylon at the time. Dr. J. C. Cooke, Medical Officer, Grade I., was appointed to act as Provincial Surgeon, Eastern Province, with effect from November 25, 1918, and Dr. H. Ludovici, Medical Officer, Grade I., was appointed Acting Inspecting Medical Officer for the Central Province, with effect from January 16, 1918. Dr. C. F. Nugara, Medical Officer, Grade I., ceased to be a member of the Department from November 18, 1918. Drs. A. A. M. Weeraperumal and S. P. Joseph were promoted from Grade II. to Grade I. of Medical Officers, and Drs. K. T. Nath, D. B. de Alwis, C. Sabhapati, and S. K. Chinniah were promoted from Grade III. to Grade II. during the year. The following were admitted as Third Grade Medical Officers during the year :—Miss (Dr.) M. A. Pinto, Drs. J. E. Felix, V. Kathirgamatamby, V. Sivapragasam, T. Sivapragasam, R. W. van Cuylenberg, C. A. Anandappa, L. D. F. J. Paul, C. Gurusamy, A. F. Seneviratne, A. G. Punchihewa, and P. D. J. Milanius.

74. The following statement shows the expenditure and receipts of the Department, inclusive of Medical Aid Estates Branch, for the financial year 1917–18:—

<i>Expenditure.</i>	Rs.	c.	<i>Revenue.</i>	Rs.	c.
Personal emoluments ..	1,610,351	33	Hospital and dispensary receipts ..	135,957	16
Other charges ..	1,368,725	48	Sale of drugs, &c. ..	2,644	85
Hospitals and dispensaries ..	1,062,813	40	Sale of drugs under Medical Wants Ordinance ..	5,209	35
			Medical aid dues, maintenance, and visits ..	162,732	79
			Rent of buildings, sale of unservicio- able and superfluous articles, and rent of trees and garden produce ..	21,043	70
Total ..	2,431,538	88	Total ..	327,587	85
Grand Total ..	4,041,890	21	Nett Expenditure ..	3,714,302	36

G. J. RUTHERFORD,  
Principal Civil Medical Officer and  
Inspector-General of Hospitals.

Colombo, April 8, 1919.

## APPENDIX.

### OPIUM.

SINCE the previous report there have been no amendments to or alterations of the Ordinance.

2. The selling price of eating opium was raised from 1 cent to  $1\frac{1}{2}$  cents for one grain of opium, with effect from October 1, 1918. The selling price of smoking opium remains the same as last year, viz., 2 cents for one grain of opium.

3. The number of opium depôts in the Island remains the same as last year, viz., 54. Applications having been made by opium consumers residing in the Northern Province, some depôts in the Province which had been established for sale of opium to vedalaras only were opened for sale of opium to consumers also.

4. During the year 43 new opium consumers were registered. The number of registrations is more than that of the previous year, but all the cases were absolutely necessary.

5. A statement of opium sold and the amounts realized during each quarter of the year is appended. It will be noticed that the total sales for the year are less than those of the previous year, which is inserted for comparison. Owing to the increase in the selling price of eating opium, the amount realized has been more than that of the previous year :—

Statement of Opium sold and Amounts realized during each Quarter from January 1, 1918, to December 31, 1918.

During the Quarter ended	Eating Opium.			Smoking Opium.			Total realized.	
	Quantity sold. Grains.	Amount realized. Rs. c.		Quantity sold. Grains.	Amount realized. Rs. c.		Rs. c.	
March 31, 1918 ..	13,195,288 ..	131,952 88 ..		1,034,100 ..	20,682 0 ..		152,634 88 ..	
June 30, 1918 ..	12,816,425 ..	128,165 25 ..		968,825 ..	19,376 50 ..		147,541 75 ..	
September 30, 1918 ..	13,105,982 ..	131,059 82 ..		965,475 ..	19,309 50 ..		150,369 32 ..	
December 31, 1918 ..	11,584,986 ..	174,548 23 ..		1,167,750 ..	23,355 0 ..		197,903 23 ..	
Total for 1918 ..	50,702,681 ..	565,726 18 ..		4,136,150 ..	82,723 0 ..		648,449 18 ..	
Total for 1917 ..	54,033,930 ..	540,341 30 ..		4,269,100 ..	85,382 0 ..		625,723 30 ..	

6. The amount realized out of the sale of opium preparations during the year was Rs. 7,792·45.

7. During the year 1918 sixty chests of opium were purchased from India for Rs. 207,677·54, as against sixty chests during the previous year for Rs. 204,765·31.

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